

CLAIMS

1. A method for producing a collagen polypeptide, wherein said collagen is selected from the group comprising collagen types IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, 5 XVI, XVII, XVIII, and XIX, comprising:

a. culturing a host cell, wherein said host cell has been infected, transfected or transformed with (i) a first expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes a collagen subunit; and 10 (ii) a second expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes at least one collagen post-translational enzyme or subunit thereof; and

b. purifying said collagen polypeptide.

15 2. The method of Claim 1 wherein the host cell is selected from the group consisting of a yeast cell, a plant cell, an insect cell and a mammalian cell.

20 3. The method of Claim 1 wherein the host cell is further infected, transfected or transformed with a third expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes a second collagen subunit.

25 4. The method of Claim 3 wherein the host cell is further infected, transfected or transformed with a fourth expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes a third collagen subunit.

30 5. The method of Claim 1 wherein said collagen post-translational enzyme is selected from the group consisting of prolyl-4-hydroxylase, lysyl oxidase, lysyl hydroxylase, C-proteinase, and N-proteinase.

35 6. The method of Claim 1 wherein the collagen post-translational enzyme subunit is selected from the group

consisting of an alpha subunit of prolyl-4-hydroxylase and a beta subunit of prolyl-4-hydroxylase.

7. A method for producing a procollagen polypeptide, 5 wherein said procollagen is selected from the group comprising collagen types IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, XVII, XVIII, and XIX, comprising:
10 a. culturing a host cell, wherein said host cell has been infected, transfected or transformed with: (i) a first expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes a collagen subunit; and (ii) a second expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes at least one collagen post-translational enzyme or subunit
15 thereof; and
b. purifying said procollagen polypeptide.

8. The method of Claim 7 wherein the host cell is selected from the group consisting of a yeast cell, a plant 20 cell, an insect cell and a mammalian cell.

9. The method of Claim 7 wherein the host cell is further infected, transfected or transformed with a third expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes a second collagen subunit.
25

10. The method of Claim 9 wherein the host cell is further infected, transfected or transformed with a fourth expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes a third collagen subunit.
30

11. The method of Claim 7 wherein said collagen post-translational enzyme is selected from the group consisting of prolyl-4-hydroxylase, lysyl oxidase and lysyl hydroxylase.

35

12. The method of Claim 7 wherein the collagen post-translational enzyme subunit is selected from the group

consisting of an alpha subunit of prolyl-4-hydroxylase and a beta subunit of prolyl-4-hydroxylase.

13. A collagen polypeptide, wherein said collagen is selected from the group comprising collagen types IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, XVII, XVIII, and XIX, manufactured according to a method comprising:

- a. culturing a host cell, wherein said host cell has been infected, transfected or transformed with: (i) a first expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes a collagen subunit; and (ii) a second expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes at least one collagen post-translational enzyme or subunit 15 thereof; and
- b. purifying said collagen polypeptide.

14. The collagen polypeptide of Claim 13 wherein the host cell is selected from the group consisting of a yeast cell, a 20 plant cell, an insect cell and a mammalian cell.

15. The collagen polypeptide of Claim 13 wherein the host cell is further infected, transfected or transformed with a third expression vector comprising a polynucleotide molecule 25 having a nucleic acid sequence which encodes a second collagen subunit.

16. The collagen polypeptide of Claim 15 wherein the host cell is further infected, transfected or transformed with a 30 fourth expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes a third collagen subunit.

17. The collagen polypeptide of Claim 13 wherein said 35 collagen post-translational enzyme is selected from the group consisting of prolyl-4-hydroxylase, lysyl oxidase, lysyl hydroxylase, C-proteinase, and N-proteinase.

18. The collagen polypeptide of Claim 13 wherein the collagen post-translational enzyme subunit is selected from the group consisting of an alpha subunit of prolyl-4-hydroxylase and a beta subunit of prolyl-4-hydroxylase.

5

19. The collagen polypeptide of Claim 13 wherein said polypeptide is not glycosolated.

20. The collagen polypeptide of Claim 13 wherein said
10 polypeptide is partially deglycosolated.

21. A host cell which has been infected, transfected or transformed with: (i) a first expression vector comprising a polynucleotide molecule having a nucleic acid sequence which
15 encodes a collagen subunit; and (ii) a second expression vector comprising a polynucleotide molecule having a nucleic acid sequence which encodes at least one collagen post-translational enzyme or subunit thereof.

20 22. The host cell of Claim 21 wherein said host cell is further infected, transfected or transformed with a third expression vector comprising a second collagen subunit.

25 23. The host cell of Claim 22 wherein said host cell is further infected, transfected or transformed with a fourth expression vector comprising a third collagen subunit.

30

35